

WHAT IS CLAIMED IS:

1. A catalyst deterioration suppressing apparatus that suppresses deterioration of an exhaust purifying catalyst which purifies toxic substances in exhaust gas emitted from an engine, comprising:

a catalyst temperature estimating element that one of detects and estimates a temperature of the catalyst;

a fuel supply stopping element that stops supply of fuel to the engine during deceleration;

a fuel supply stop prohibiting element operable when said catalyst temperature estimating element determines that the temperature of the catalyst lies in a high temperature range equal to or greater than a predetermined temperature, for prohibiting said fuel supply stopping element from stopping the supply of fuel;

an air-fuel ratio control element that feedback-controls an air-fuel ratio such that the air-fuel ratio is equal to a target air-fuel ratio set based on an operative state of the engine; and

a feedback control prohibiting element operable when said fuel supply stop prohibiting element prohibits the supply of fuel from being stopped, for prohibiting said air-fuel ratio control element from providing feedback control.

2. A catalyst deterioration suppressing apparatus according to claim 1, wherein said air-fuel ratio control element feedback-controls a fuel injection quantity such that the air-fuel ratio is equal to the target air-fuel ratio.

3. A catalyst deterioration suppressing apparatus according to claim 2, wherein said air-fuel ratio control element comprises,

a target intake air quantity setting element that sets a target intake air quantity according to an operative state of the engine, and

a fuel injection quantity setting element that sets the fuel injection quantity according to the target air-fuel ratio and the target intake air quantity,

wherein said air-fuel ratio control element feedback controls the fuel injection quantity set by said fuel injection quantity setting element such that the air-fuel ratio is equal to the target air-fuel ratio.

4. A catalyst deterioration suppressing apparatus according to claim 3, wherein said air-fuel ratio control element is operable when said fuel supply stop prohibiting element prohibits the supply of fuel from being stopped, for setting the fuel injection quantity according to the target intake air quantity and a stoichiometric air-fuel ratio.

5. A catalyst deterioration suppressing apparatus according to claim 1, wherein said air-fuel ratio control element is operable when said feedback control prohibiting element prohibits said air-fuel ratio from providing feedback control, for open-loop controlling the air-fuel ratio.

6. A catalyst deterioration suppressing apparatus according to claim 5, wherein said air-fuel ratio control element is operable when said feedback control prohibiting element prohibits said air-fuel ratio from providing feedback control, for controlling the air-fuel ratio to a stoichiometric air-fuel ratio or to a leaner air-fuel ratio than the stoichiometric air-fuel ratio.

7. A catalyst deterioration suppressing apparatus according to claim 1, wherein the air-fuel ratio is detected or calculated according to air-fuel ratio information based on an output from an exhaust sensor provided in an exhaust passage.

8. A catalyst deterioration suppressing apparatus that suppresses deterioration of an exhaust purifying catalyst that purifies toxic substances in exhaust from an engine, comprising:

a catalyst temperature estimating element that one of detects and estimates a temperature of the catalyst;

a fuel supply stopping element that stops supply of fuel to the engine during deceleration;

a fuel supply stop prohibiting element operable when said catalyst temperature estimating element determines that the temperature of the catalyst lies in a high temperature range equal to or greater than a predetermined temperature, for prohibiting said fuel supply stopping element from stopping the supply of fuel;

an intake air quantity adjusting element for adjusting a quantity of intake air supplied to the engine; and

a correcting element operable when the supply of fuel is prohibited by said fuel supply stop prohibiting element, for correcting an amount of control for said intake air quantity adjusting element such that the quantity of the intake air supplied to the engine is reduced.

9. A catalyst deterioration suppressing apparatus according to claim 8, wherein said correcting element reduces the quantity of the intake air when the supply of fuel is stopped.

10. A catalyst deterioration suppressing apparatus according to claim 8, further comprising:

a dash pot control element that provides dash pot control such that an amount of control for said intake air adjusting element during the deceleration is corrected by a greater amount than in normal operation,

wherein said correcting element corrects an amount of control by said dash pot control element.

11. A catalyst deterioration suppressing method that suppresses deterioration of an exhaust purifying catalyst which purifies toxic substances in exhaust gas emitted from an engine, comprising:

stopping supply of fuel to the engine during deceleration;

one of detecting and estimating a temperature of the catalyst;

prohibiting supply of fuel from being stopped when the temperature of the catalyst lies in a high temperature range equal to or greater than a predetermined temperature; and

prohibiting feedback control of an air-fuel ratio when the supply of fuel is prohibited from being stopped.

12. A catalyst deterioration suppressing method according to claim 11, wherein the air-fuel ratio is feedback-controlled by feedback controlling a fuel injection quantity such that the air-fuel ratio is equal to a target air-fuel ratio set according to an operative state of the engine.

13. A catalyst deterioration suppressing method according to claim 12, wherein the air-fuel ratio is feedback controlled by setting the fuel injection quantity according to the target air-fuel ratio and the target intake air quantity set according to the operative state of the engine, and the fuel injection quantity, and feedback-controlling the fuel injection quantity such that the air-fuel ratio is equal to the target air-fuel ratio.

14. A catalyst deterioration suppressing method according to claim 11, further comprising:

open-loop controlling the air-fuel ratio when the feedback control of the air-fuel ratio is prohibited.

15. A catalyst deterioration suppressing method according to claim 14, wherein in the step for open-loop controlling the air-fuel ratio, the air-fuel ratio is controlled to one of a stoichiometric air-fuel ratio and a leaner air-fuel ratio than the stoichiometric air-fuel ratio.

16. A catalyst deterioration suppressing method for suppressing deterioration of an exhaust purifying catalyst that purifies toxic substances in exhaust from an engine, comprising:

stopping supply of fuel to the engine during deceleration;

one of detecting and estimating a temperature of the catalyst;

prohibiting said fuel supply stopping element from stopping the supply of fuel when said catalyst temperature estimating element determines that the

temperature of the catalyst lies in a high temperature range equal to or greater than a predetermined temperature; and

reducing a quantity of intake air supplied to the engine when the supply of fuel is prohibited.